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SEA NETTLES OR JELLYFISHES

Sea nettles and jellyfishes are strange-looking, free-swimming animals of the sea, very common and widely distributed in the ocean from cold polar areas to warm tropical waters. The numerous tentacles hanging from the umbrella-like body of a jellyfish give it a certain resemblance to a well known character of Greek mythology. Hence, the name Medusa is often applied to them. By slow pulsating movements of their bodies the medusae swim near the surface of the water or drift passively with the tides. At times they swarm locally in very large numbers and attract attention by their bizarre appearance and beautiful coloration.

The large group of organisms to which the jellyfishes belong is called by scientists Coelenterates, the term meaning that in all these animals the body cavity ("coel" in Greek) performs the function of a digestive tract or gut (enteron). Many of the complex organs or tissues such as heart, blood vessels, kidneys, brain, etc., found in higher forms are absent in Coelenterates, which because of the relative simplicity of their anatomy are considered to be the lowest among the many-celled animals.

Coelenterates are divided into three major groups or classes. To the first one, the Hydrozoa, belong many small jellyfishes, colonial or single polyps, including the fresh water Hydra, and a few stony corals. The second group, Scyphozoa, includes most of the larger and best known marine medusae. Sea anemones, the reef corals, and sea fans compose the third group of sessile organisms known as Anthozoa.

The common names, jellyfish and sea nettle, denote the two principal characters of these forms. The body of a jellyfish is made of soft gelatinous substance, about 96 percent of which consists of water, while the living organs, tissues and mineral salts make up the remaining 4 percent. The word "sea nettle" refers to the presence of stinging capsules, so-called nematocysts, special microscopic structures used in the capture of food and for protection against the attack of enemies. These characteristic capsules of Coelenterates are rather complex and probably have different functions to perform. It has been shown that some may perforate the skin of the prey, while others entangle the prey mechanically or secrete a sticky fluid by which the victim is held. The nematocyst is essentially an oval-shaped bag containing a hollow, spirally coiled thread located in a cell with a short protruding trigger, the cnidocil. It is of minute size and can be seen only under a microscope.

When stimulated by chemical action or by contact, the nematocyst "explodes", the thread is thrown out and penetrates the surface of the body of the approaching prey. The discharge of the thread is accomplished by eversion, as when a glove finger is drawn off the hand. The basal end of the thread may be simple, or armed with stylets, barbs, and projecting teeth. Some of the nematocysts are filled with a light fluid which apparently performs a hydrostatic function in preventing the prey from breaking away under its own weight.

The stinging capsules, particularly numerous on tentacles and mouth lips, are found also anywhere over the body surface of a jellyfish. Apparently they secrete a poison which may act by direct application to the skin without even puncturing it. The nature of this substance is not known. In the majority of species the poison is not sufficiently strong to be felt by humans. There are, however, several species of medusae which inflict more or less severe burns. It has been recorded, for instance, that in 1921 hundreds of bathers suffered irritation from a large jellyfish Cyanea near the mouth of Boston Harbor. Considerable discomfort and nuisance to vacationists is caused also every summer by Dactylometra, a medusa frequently occurring in warm southern waters.

To the Portuguese Man-of-War, Physalia, belongs, however, the questionable distinction of being the most dangerous jellyfish. A slight touch to the long tentacles of this beautiful animal, easily recognizable by its bluish float filled with air and protruding over the surface of water, causes severe pain and serious inflammation of the skin. Considerable caution should be exercised in catching or even approaching this animal. Its thin tentacles, invisible from the surface of water, extend over many feet and trail behind the float driven by wind. Attempts to pick it up with naked hands and arms result in serious injury which may require several weeks of hospitalization. The sting of some of the tropical medusae is even more dangerous than that of the Portuguese Man-of-War and, as records show, may be fatal.

All jellyfishes are classed into two distinct groups, the Hydromedusae and Scyphomedusae. Hydromedusae are usually small, varying in size from a pin's head to a penny. The simplest of them are bell-shaped or hemispherical with a pendulum-like structure, which contains the mouth and stomach, hanging from the center of an umbrella. Four canals, radiating from the stomach, are joined by a circular canal located around the edge of the umbrella. The number of tentacles attached to the swollen bases on the margin of the umbrella varies greatly in different genera and serves as one of the characters for identification. All Hydromedusae have a thin flap of muscular tissue, a "velum", running like a diaphragm around the inner side of the edge of the umbrella. This is the swimming organ of the animal.

A typical free-swimming hydromedusa represents the sexual form which develops on a colony of branching polyps attached to rocks, pilings or other submerged objects. From the egg, shed by the medusa and fertilized in water by sperm, a free-swimming larva, called a "planula", emerges and eventually attaches to some object and develops into a sessile polyp which by budding and branching produces a new colony.

Like all jellyfishes the Hydromedusae catch food with the tentacles armed with stinging cells. They feed on small crustacea but quite often eat other animals as large as themselves.

The Portuguese Man-of-War, mentioned above, belongs to a special group of Hydromedusae known as Siphonophores. The animal consists really of a colony comprising several orders of individuals performing different functions, such as catching food, protection, reproduction, etc., yet remaining in communication with one another through a common digestive space. The colony is provided with a float inflated with gas and is driven throughout the ocean by wind and currents.

Scyphomedusae include the larger, exclusively marine jellyfishes which can be distinguished from Hydromedusae by the absence of a velum (diaphrahm under the umbrella) and the presence of gastric filaments in the stomach. The sexual products are discharged through the mouth and develop into a small oval-shaped creature covered with cilia. It is also a "planula". After a short period of free life it settles on the bottom, its upper end quickly develops a mouth surrounded by a crown of tentacles, which gives the planula the appearance of Hydra. After a time several transverse constrictions are formed and the organism now resembles a number of saucers or bowls piled one upon the other. Each of these saucers is in turn liberated, swims away, and develops into an adult medusa.

Among the most common Scyphomedusae the best known is probably the white jellyfish, Aurelia. These flat, disc-like animals with a great many delicate tentacles hanging from the margin of the umbrella, abound along the entire Atlantic coast breeding throughout the summer.

The speckled jellyfish, Dactylometra, and the red jellyfish, Cyanea, have already been mentioned as organisms that should be avoided because of their stinging cells, which produce a burning sensation and may cause more serious injuries. Every summer huge swarms of Dactylometra appear in the Chesapeake Bay where they constitute a great nuisance to fishermen and bathers.

Cyanea is the largest jellyfish known to inhabit the sea. A huge specimen with a disc seven and a half feet in diameter and tentacles extending over 100 feet was observed in Massachusetts Bay by the famous American naturalist, Alexander Agassiz. Usually the Cyanea found in our waters are much smaller, varying from 4 to 20 inches in diameter.

A massive gelatinous Rhizostoma is of interest because it has no tentacles and is devoid of a true mouth. Its lips have fused together to form a solid mass penetrated by fine canals which communicate with the exterior through numerous tiny pores into which food is taken.

Many of the medusae are phosphorescent at night, producing beautiful flashes of bluish light when stimulated by waves or the wake of a passing boat.

Ctenophores. Very common jellyfishes known as Sea Gooseberries constitute a distinct group, not related to Coelenterates. They differ from true medusae by the presence of eight meridional rows of plates each having the appearance of a small comb. Hence, the scientific name Ctenophores from Greek "ctenos" - a comb and "fero" - to bear.

The body of a Ctenophore is more or less spherical or pear-shaped with a pair of long tentacles extending from it. They lack the stinging capsules of Coelenterates but are provided with peculiar adhesive cells located on the tentacles which aid in capturing prey. In swimming they are propelled by a synchronized beating along the eight rows of comb plates. Ctenophores often occur in enormous schools clogging fishermen's nets and depleting the water of small crustaceans and other organisms which constitute the food of young fishes. Frequently the latter are engulfed by these delicate but voracious creatures. In this way, like true jellyfishes, the Ctenophores may cause damage to our fishes destroying the young or cutting down the supply of their food.

At night they display beautiful phosphorescence.

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